

Chapter 6: Repair

Repairs are defined as items necessary for the effective performance or preservation of weatherization materials. Examples include, but are not limited to, repairing roof leaks, electrical hazards, and hot- and cold-water leaks; and installing protective materials, such as paint used to seal materials installed through weatherization.

Follow all applicable lead and asbestos-safe work practices when performing repairs.

6.1 Windows and Doors

Many weatherization customers perceive that door and window measures will produce substantial energy savings. Because windows and doors typically make up a small percentage of the entire building thermal boundary, however, often not enough heat is lost through them to justify cost-effective repair or replacement.

Widespread blower-door testing has shown that windows and doors do not tend to harbor large air leaks. Though conductive and convective losses through windows and doors are often quite high on a per-square-foot basis, these are not affected much by most simple weatherization improvements.

Replacing missing and broken glass, re-glazing glass, installing sash locks, and installing weather-stripping is considered air sealing (see *Air-Sealing and Indoor Air Quality in Chapter 1 – Section 1.4*).

6.1.2 Window Repair and Replacement

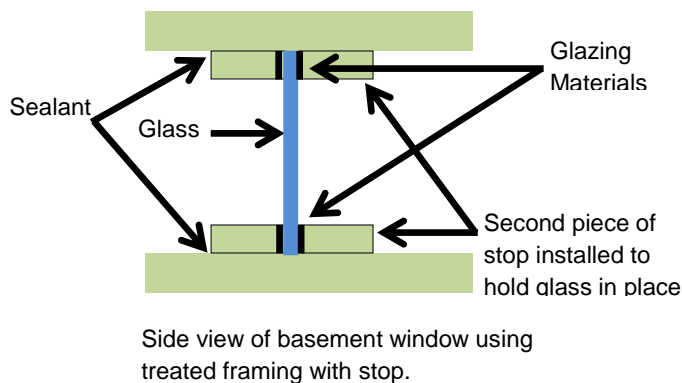
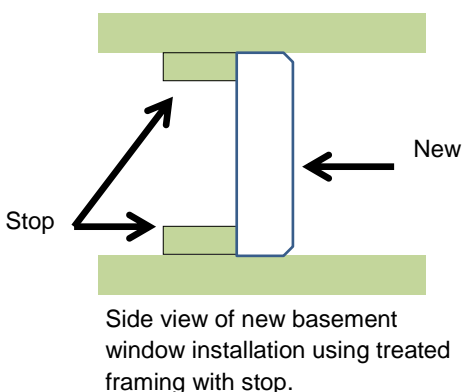
Observe the following standards for window repair and replacement:

1. Seal around the replacement windows on the exterior and interior to prevent water intrusion and air infiltration.
2. If replacing or installing new exterior trim or stop, prime the bare wood.
3. If replacing a broken pane of glass, size the replacement pane $\frac{1}{8}$ " to $\frac{3}{16}$ " smaller than the opening, to allow for movement of the frame.
4. Install safety glass when the location requires it.

Replacing or Repairing a Basement Window

Determining whether to repair or replace windows located in an unintentionally conditioned basement is based upon customer use. Customers may want to operate the window or want the natural light provided by the window. Covering the entire window with plywood or other sheathing should only be considered when it is clear that the customer is agreeable to this option.

Before installing a new window, remove rotted framing and replace with pressure-treated lumber. Seal around framing to prevent water intrusion. Standard-size vinyl basement windows are a good choice for replacement when the customer requires an operable window. Install a stop inside the framing as needed to place new window or glass against. Technicians can cut a custom-sized piece of glass for openings allowing natural light to enter. A second piece of stop is used to hold the glass in place from the inside.



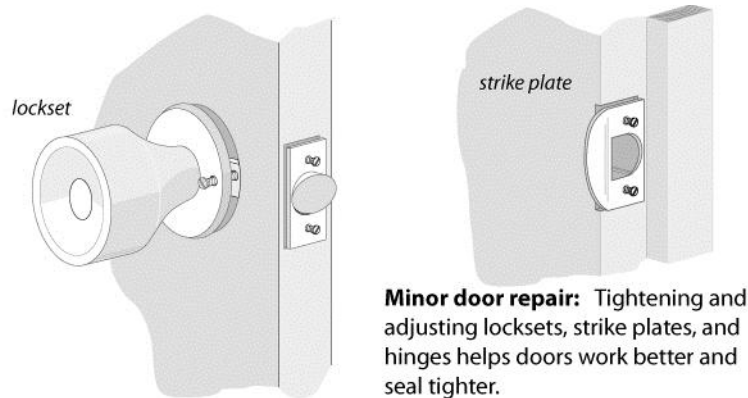
6.1.3 Door Repair and Replacement

Door operation affects building security and durability, so doors are often an important repair priority.

Door Repair

Door repair can also save energy if the door currently has a poor fit. Limit door repair to the following:

1. Replace missing or inoperable locksets. In some cases, a modernizer kit may be necessary.
2. Replace, install, or reposition the strike plate, as needed.
3. Replace, install, or reposition stops, as needed.
4. Replace deteriorated threshold.
5. Install a door shoe if needed to repair damage.



Replacing a Primary Door

Follow these instructions when replacing a primary door:

1. Seal around the replacement door on the exterior and interior to prevent water intrusion and air infiltration.
2. If replacing or installing new exterior trim or stop, prime the bare wood.
3. After installation, confirm the door opens and closes smoothly, latches, and locks when shut.

Replacing or Fabricating a Basement Door

In older homes, basement exterior doors are often odd shapes and sizes. Sometimes, no door is present. If a door is present, it is sometimes in disrepair. Often weatherization installers fabricate a replacement door out of lumber — for air-sealing purposes, security reasons, to preserve weatherization materials, or to maintain the integrity of the existing building materials.

Follow these instructions when fabricating a replacement basement door:

1. Use treated lumber.
2. Take precautions to reinforce the door, to prevent warping and to ensure longevity.
3. Seal around the replacement-door framing on the exterior and interior to prevent water intrusion and air infiltration.
4. After installation, confirm the door opens and closes smoothly, latches, and locks when it is shut.

6.2 Dryer Venting

Dryers can cause significant moisture issues in homes if not vented to the exterior. Gas dryers are also cause for health and safety concerns, as the exhaust gases can disperse into the home if the dryer is not vented to the exterior.

Educate the customer about proper dryer-venting maintenance. The customer should clean the exterior vent termination frequently. Once or twice each year, the customer should clean the rest of the venting system: the venting run, and the connection between the dryer and the ducting.

Follow these instructions for dryer venting:

1. Vent all dryers to the exterior, using a dedicated termination with backdraft damper/flapper. Best practice is to install a louvered (three- or four-flapper) hood, as these hoods typically have the strongest airflow and work the best to prevent vermin intrusion.
2. Do not vent dryers into attached garages, under porches, under decks, or where the moisture will damage building components.
3. Follow the most direct route to the exterior when installing dryer ducting, as feasible.
4. Use rigid metal ducting with a smooth interior surface, as feasible.
5. Seal all seams in the ducting.
6. Use a hose clamp to fasten the ducting to the dryer's exhaust port. Do not use screws to make this connection — as time passes, the screw tips will catch dryer lint, creating an obstruction and a fire hazard inside the ducting.
7. If existing dryers are vented to the exterior with vinyl ducting, re-vent the dryer to the exterior with UL listed metal ducting.
8. Insulate, to a minimum of R-8, those sections of dryer ducting that run through unconditioned space, just as you would insulate similar sections of exhaust-fan ducting.

Final Inspection and Quality Assurance Standards

Acceptable installations for repair measures should reflect the following.

General Repairs

1. The repairs are necessary for the effective installation, performance, and/or preservation of the weatherization materials installed in the building.
2. The repairs are cost efficient and still correct the problem(s) at hand.

Window Replacement

1. Window installation meets program specifications and is ENERGY STAR certified.
2. The new window opens smoothly and operates properly.
3. The new window is installed squarely, as structurally allowable.
4. The new window does not leak.
5. Installation meets all applicable best practices (e.g., drain planes and back caulked, etc.)
6. Proper lead-safe work practices are documented in file.
7. The customer file contains photographs of the old window, and the photographs demonstrate the old window met the specifications for replacement.

Door Repair

1. All necessary door repairs were undertaken.

Door Replacement

1. The new door opens and closes easily, latches tightly, and performs its function.
2. Replacement door meets R-value requirement.
3. Installation meets all applicable best practices (e.g., drain planes and back caulked, etc.)
4. Proper lead-safe work practices are documented in file.
5. The new door does not leak.
6. The new door is installed squarely, as structurally allowable.
7. The customer file contains photographs of the old door, and the photographs demonstrate the old door met the specifications for replacement.

Final Inspection and Quality Assurance Standards (continued)

Acceptable installations for repair measures should reflect the following.

Dryer Venting

1. Dryer venting is UL listed and metal.
2. The venting is secured, screws or other penetrations that will catch lint were not used.
3. A termination with a damper was used and is not connected to any other appliance.